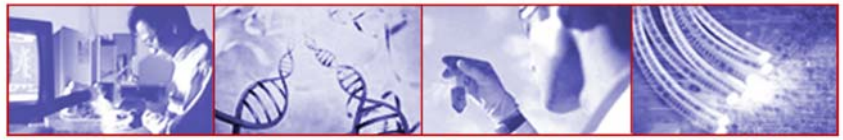
euchinagrid



Interconnection & Interoperability of Grids between Europe & China

Data Grid Infrastructure for YBJ-ARGO Cosmic-Ray Project

Gang CHEN, Hongmei ZHANG - IHEP

CODATA'06

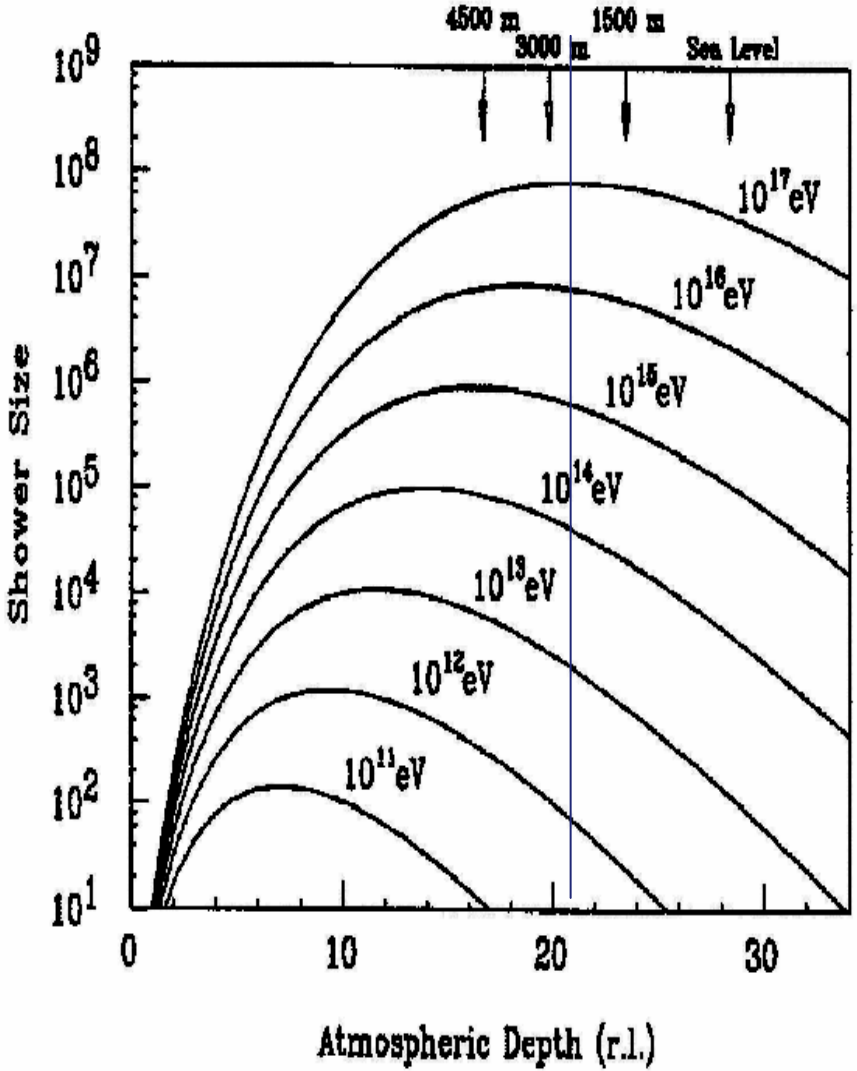
24 October 2006, Beijing

FP6–2004–Infrastructures–6-SSA-026634

Information Society and Media

http://www.euchinagrid.cn

Extensive Air Shower



Main Physics Goals

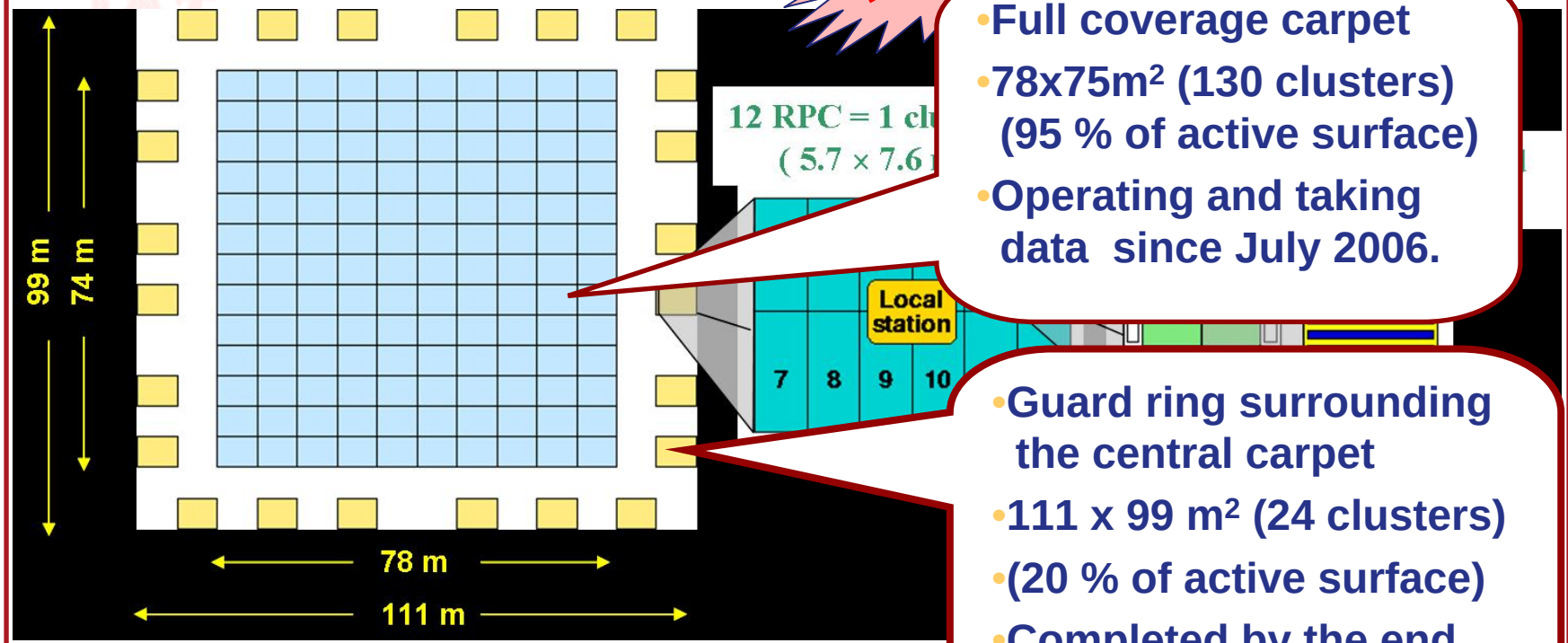
90°31'50" E, 30°6'38" N
4300m a. s. l., 606g/cm^2

- γ-astronomy（Sub-TeV，0.3I$_{Crab}$）
- Diffused γ sources（Sub-TeV）
- GRB（10GeV）
- Knee Physics
- Anti-p/p（300GeV）
- Primary Proton Spectrum（10TeV）
- Solar Physics

YBJ-ARGO

- Italy-China cosmic ray observatories in Tibet.
- 200TB raw data per year.
- Data transferred to IHEP and INFN.
- Rec. data accessible by collaborators.

YBJ-ARGO Experiment



- Full coverage carpet
- 78x75m² (130 clusters) (95 % of active surface)
- Operating and taking data since July 2006.

- Guard ring surrounding the central carpet
- 111 x 99 m² (24 clusters)
- (20 % of active surface)
- Completed by the end of 2006.

- 154 CLUSTERs, 18480 PADs
- Total detector area: 6500 m²
- Angular Resolution 0.5° (nhit>50)
- Measurement: time, number

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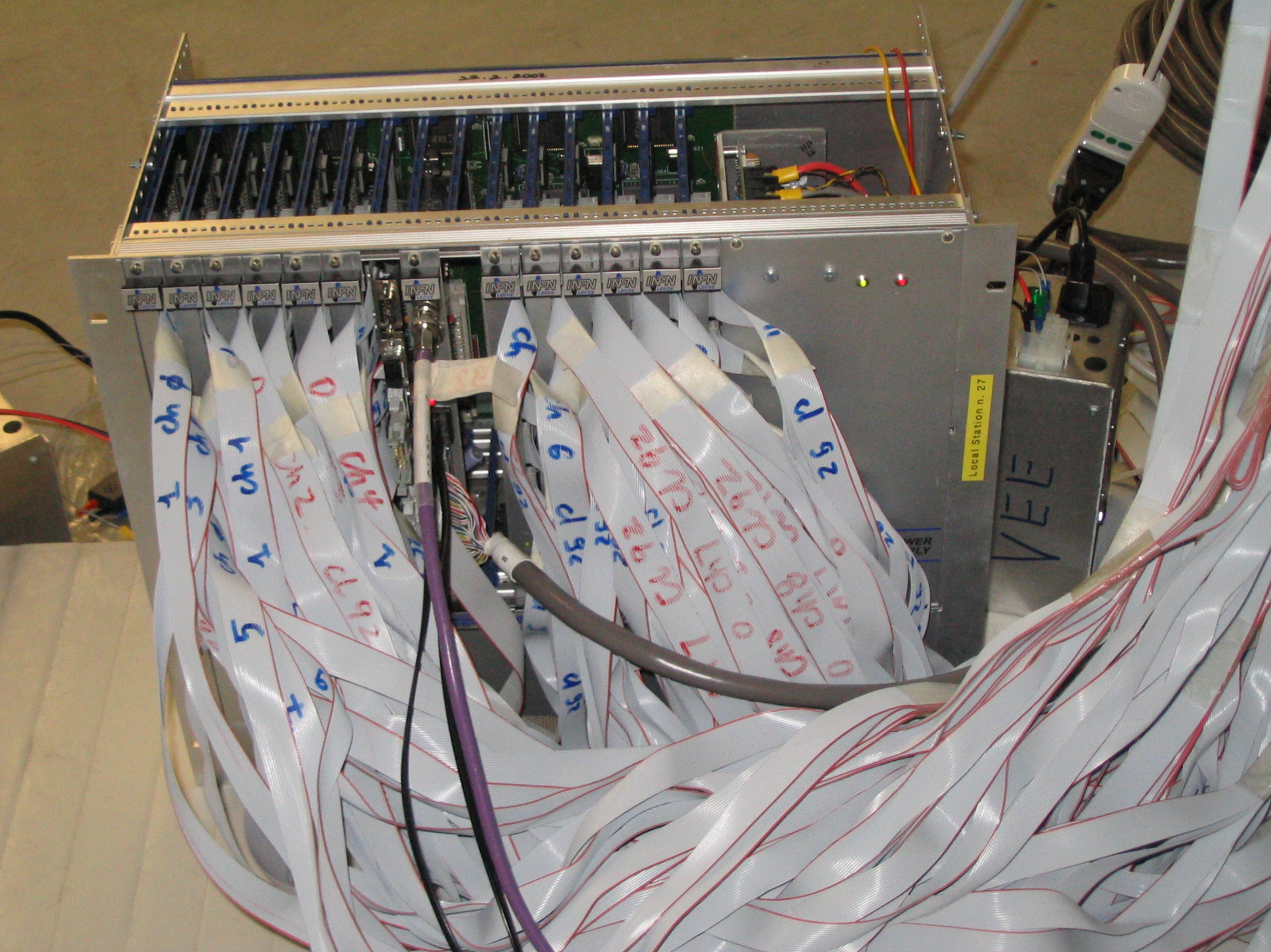
Local Station n. 27

Data Process and Physics Analysis

Detector

filtering (Rebuild)

Disk cache

Rec. Data

Raw Data

Event Reconstruction

Batch jobs

Events (physics goal)

Physics Simulation

Interactive Analysis

New ARGO-YBJ GRID computing model

- Resources integration for data processing
- Use GRID tools for an automatic data transfer system
- Data storage : keep a copy of the raw and processed data in each main computing centre (IHEP and CNAF) - backup
- Use “synchronized” Data Catalogues
- Use “synchronized” Metadata Catalogues
- Use one ARGO Data Base and replicated copy
- Same policy for Monte Carlo production

Data Transfer schema

YBJ:
- User Interface
- SRM (DPM)
- local DB

INFN
- User Interface
- SRM (DPM)
- FTS
- LFC
- local DB

IHEP
- User Interface
- SRM (DPM)
- FTS
- LFC
- local DB

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Testbed for data transfer project

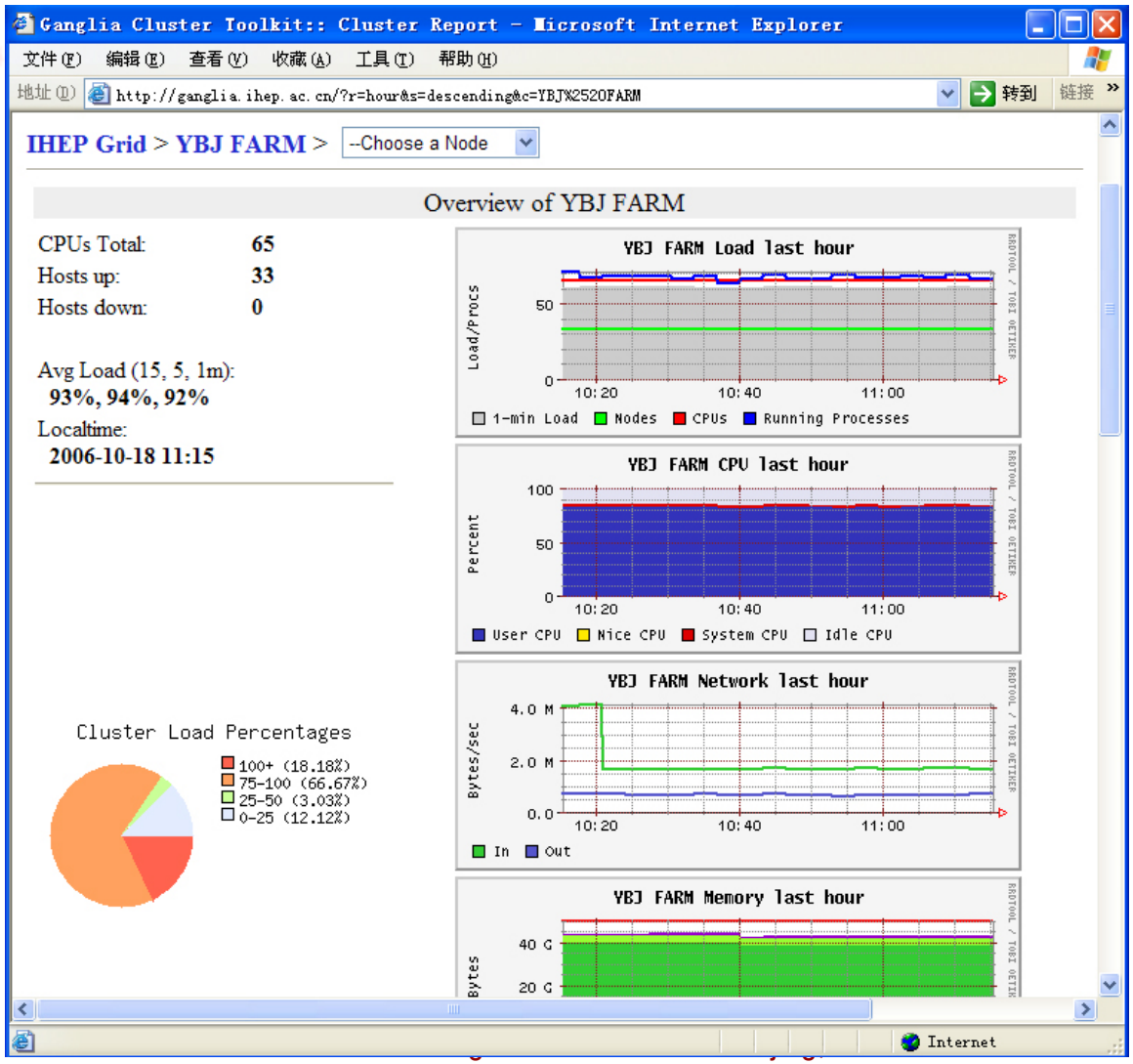
- The GRID middleware based on gLite installed
- Data transfer from DAQ to YBJ Data Mover, use of a local DB
- File Transfer via FTS to IHEP and insert in the data catalog,
- Data synchronization to CNAF via data catalog comparison
- The mechanism to delete the data files at origin (YBJ), once transferred to both computing centers, was implemented

Network Link

- Thanks to CNIC!

Computing Resources at IHEP

Resource Monitoring



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Interconnection & Interoperability of Grids between Europe & China

Database

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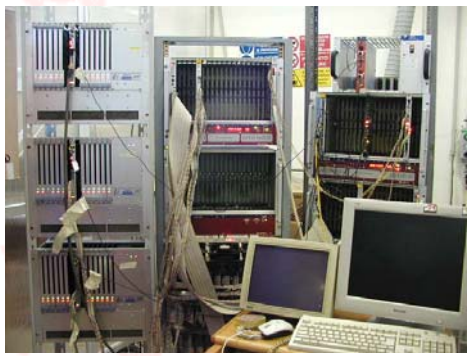
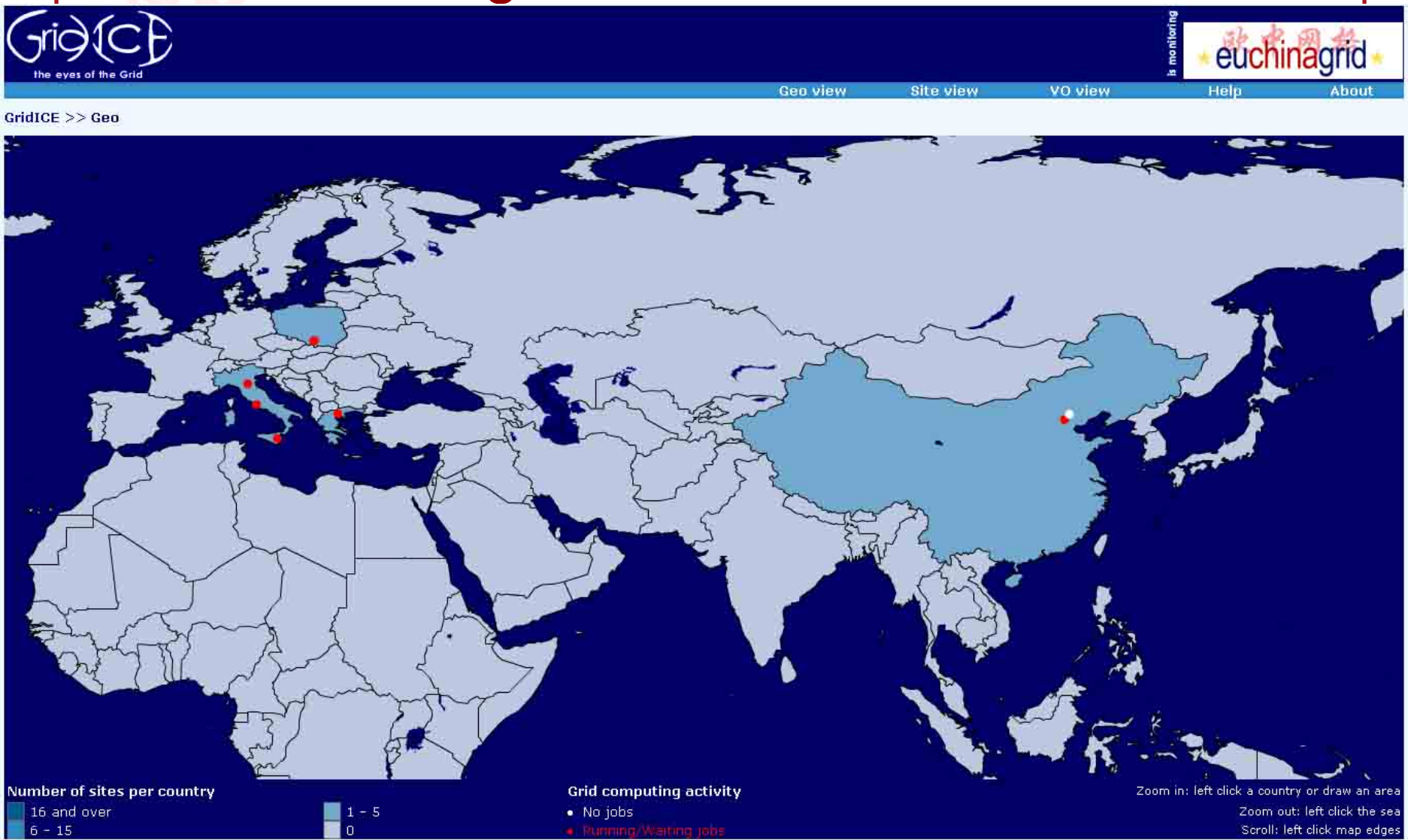
DAQ and Data Mover installation

- New DAQ hardware in place at Roma Tre ; new software and the data mover is in advanced status of installation and testing



Grid Monitoring



GridICE

GridICE — the eyes of the Grid — is monitoring euchinagrid

Geo view | Site view | VO view | Help | About

GridICE >> Site::ALL

General | Gris | Host | Job | Charts

Site		GK#	Q#	RunJob	WaitJob	SlotLoad	MH#	Power	WN#	CPU#	CPULoad	Computing Resources: Available	Computing Resources: Total	Storage Resources: %
BEIJING-CNIC-LCG2-IA64		1	1	0	0	0%	-	-	-	-	-	54.7 GB	62.8 GB	13%
BEIJING-LCG2		1	8	6	15	67%	9	73K	3	12	33%	140.2 GB	720 GB	81%
CYFRONET-IA64		1	11	31	62	94%	-	-	-	-	-	37.9 GB	94.6 GB	60%
CYFRONET-LCG2		1	14	253	16	94%	1	-	-	-	-	18.9 TB	20.6 TB	8%
GR-01-AUTH		1	10	6	16	15%	10	63K	8	16	45%	415.6 GB	478.7 GB	13%
INFN-CATANIA		1	6	217	228	98%	94	1M	89	250	71%	8.2 TB	10.6 TB	23%
INFN-CNAF		1	8	10	27	100%	21	48K	5	10	91%	863.9 GB	1.8 TB	52%
INFN-ROMA3		1	3	14	0	58%	14	183K	12	34	38%	955.2 TB	956.7 GB	0%
TOTAL		**#8**	**8**	**61**	**537**	**364**	66%	**149**	**2M**	**117**	**322**	56%	**29.5 TB**	**35.2 TB**	31%

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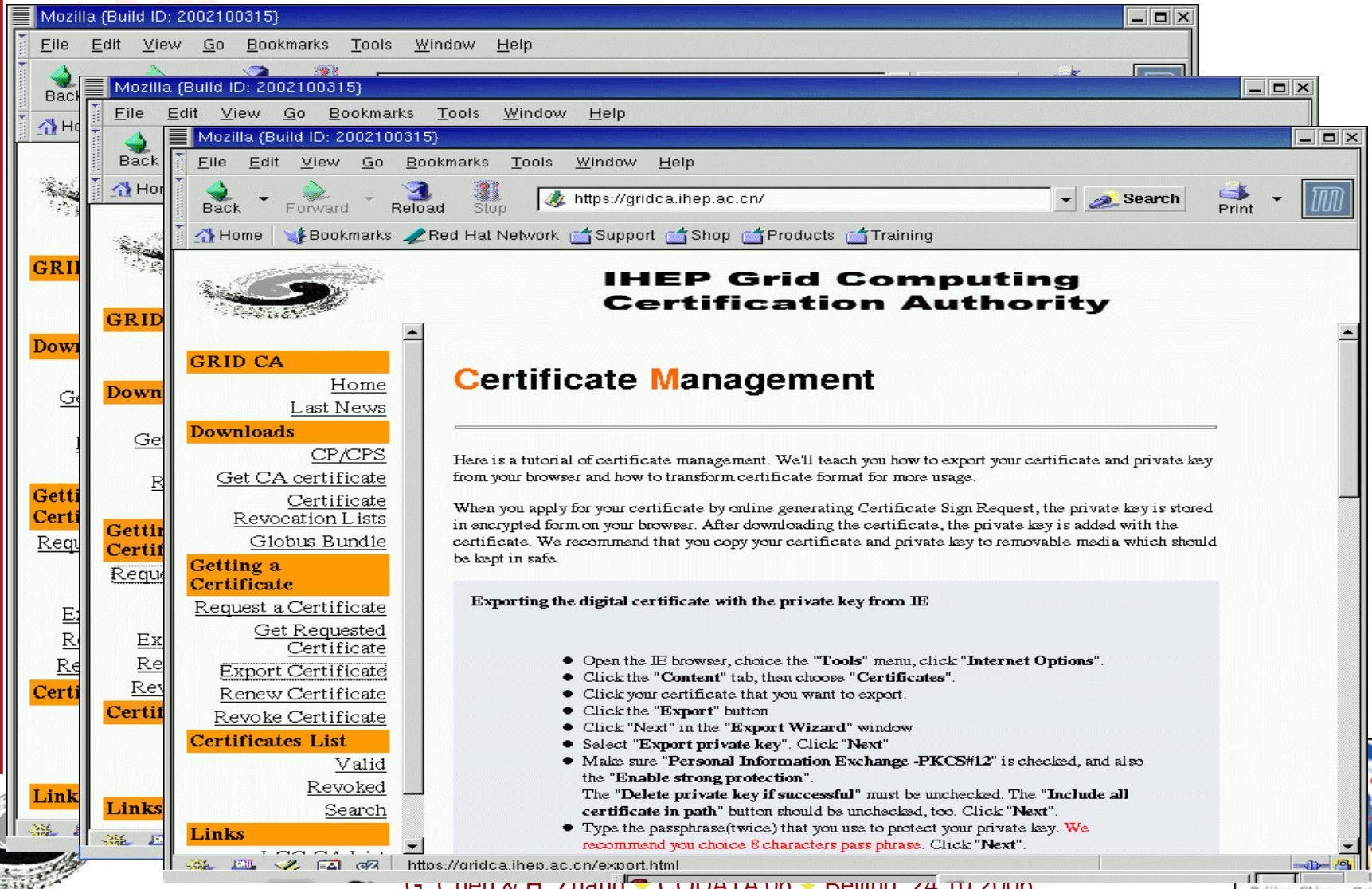
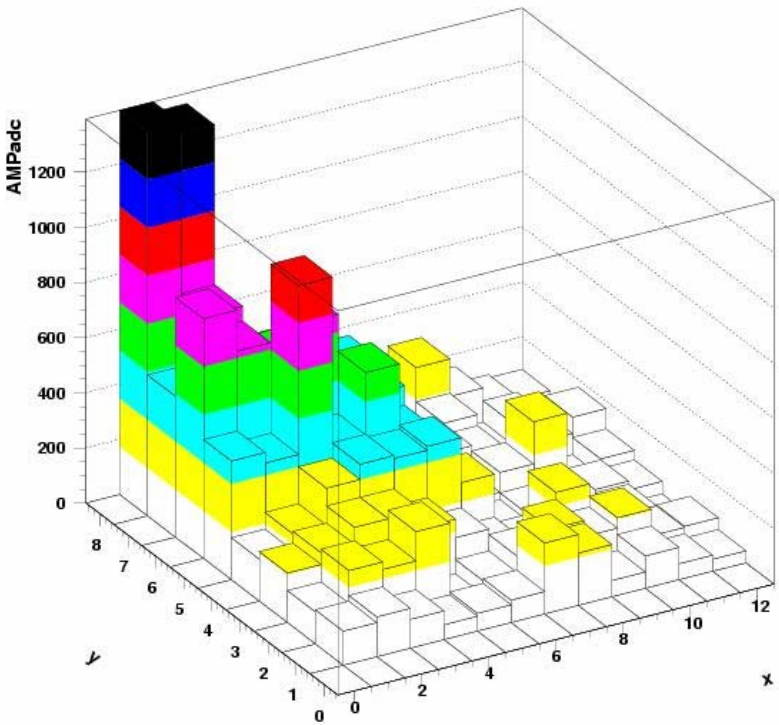
Grid site at IHEP

- RB, UI, CE, SE, Myproxy, MON (R-GMA), BDII
- WNs with Xeon CPUs
- China HEP CA, serve HEP and other communities

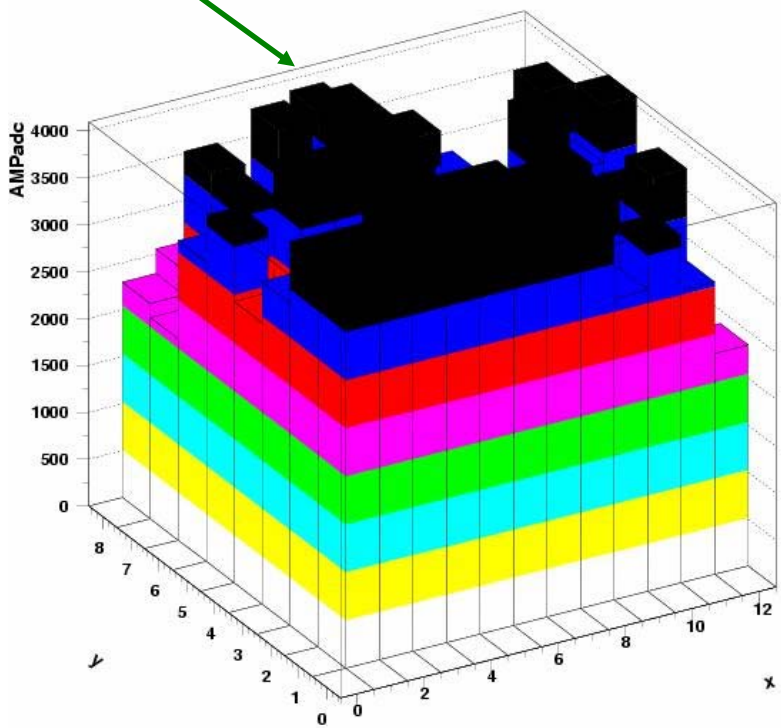
CA


Mozilla {Build ID: 2002100315}
File Edit View Go Bookmarks Tools Window Help
Back Forward Reload Stop
https://gridca.ihep.ac.cn/
Search Print
Home Bookmarks Red Hat Network Support Shop Products Training
IHEP Grid Computing
Certification Authority
GRID CA
Home
Last News
Downloads
CP/CPS
Get CA certificate
Certificate Revocation Lists
Globus Bundle
Getting a Certificate
Request a Certificate
Get Requested Certificate
Export Certificate
Renew Certificate
Revoke Certificate
Certificates List
Valid
Revoked
Search
Links
Certificate Management
Here is a tutorial of certificate management. We'll teach you how to export your certificate and private key from your browser and how to transform certificate format for more usage.
When you apply for your certificate by online generating Certificate Sign Request, the private key is stored in encrypted form on your browser. After downloading the certificate, the private key is added with the certificate. We recommend that you copy your certificate and private key to removable media which should be kept in safe.
Exporting the digital certificate with the private key from IE
Open the IE browser, choice the "Tools" menu, click "Internet Options".
Click the "Content" tab, then choose "Certificates".
Click your certificate that you want to export.
Click the "Export" button
Click "Next" in the "Export Wizard" window
Select "Export private key". Click "Next"
Make sure "Personal Information Exchange -PKCS#12" is checked, and also the "Enable strong protection".
The "Delete private key if successful" must be unchecked. The "Include all certificate in path" button should be unchecked, too. Click "Next".
Type the passphrase(twice) that you use to protect your private key. We recommend you choice 8 characters pass phrase. Click "Next".
https://gridca.ihep.ac.cn/export.html

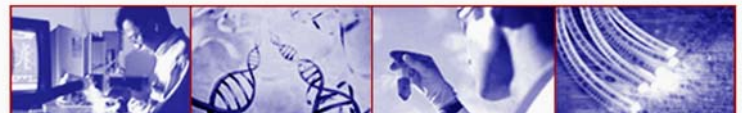
Some events...



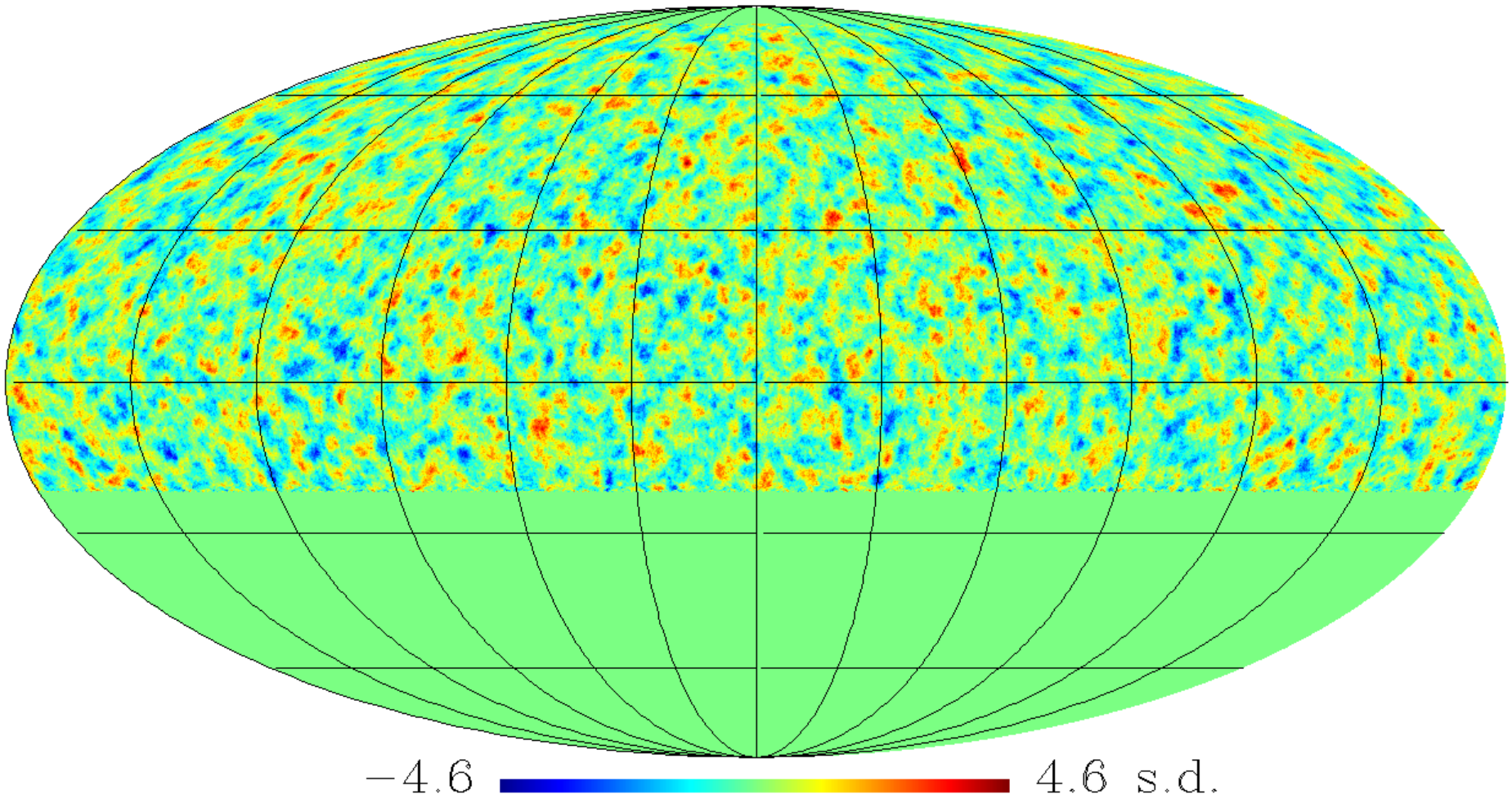
4000 ADC counts ~ 90 p/m²



Very big shower !!

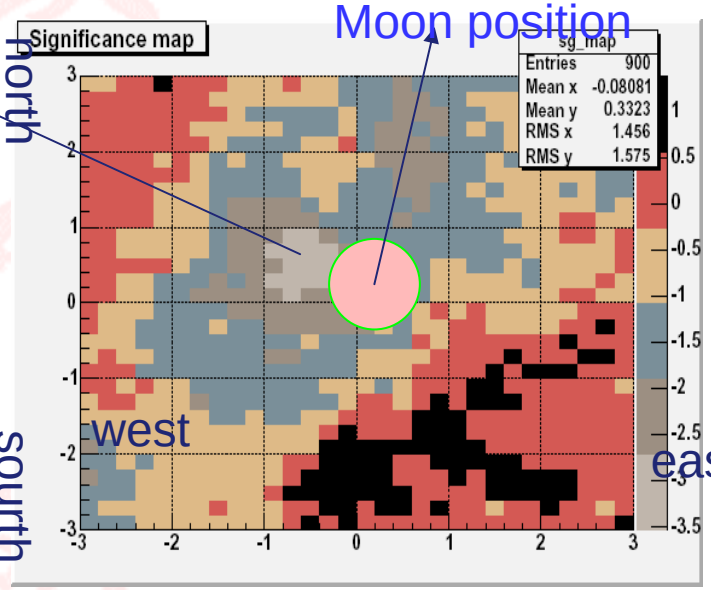


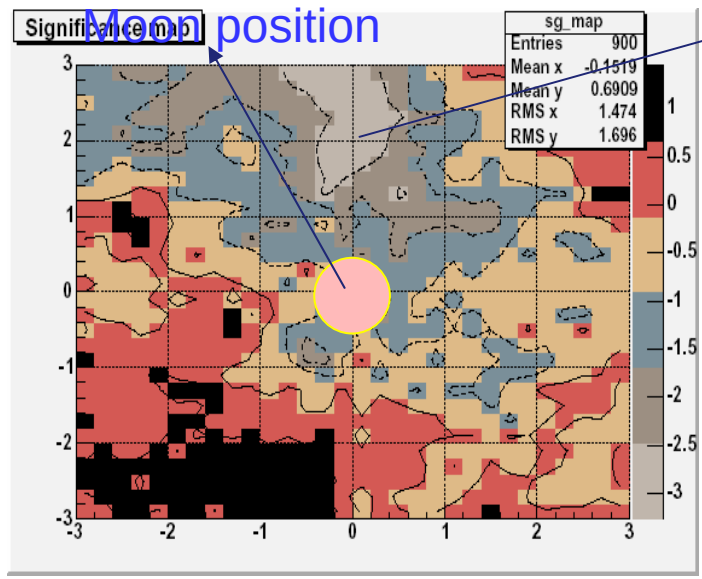
ARGO skymap



Smooth window radius = 1.5°

Moon shadows (zenith <40°)





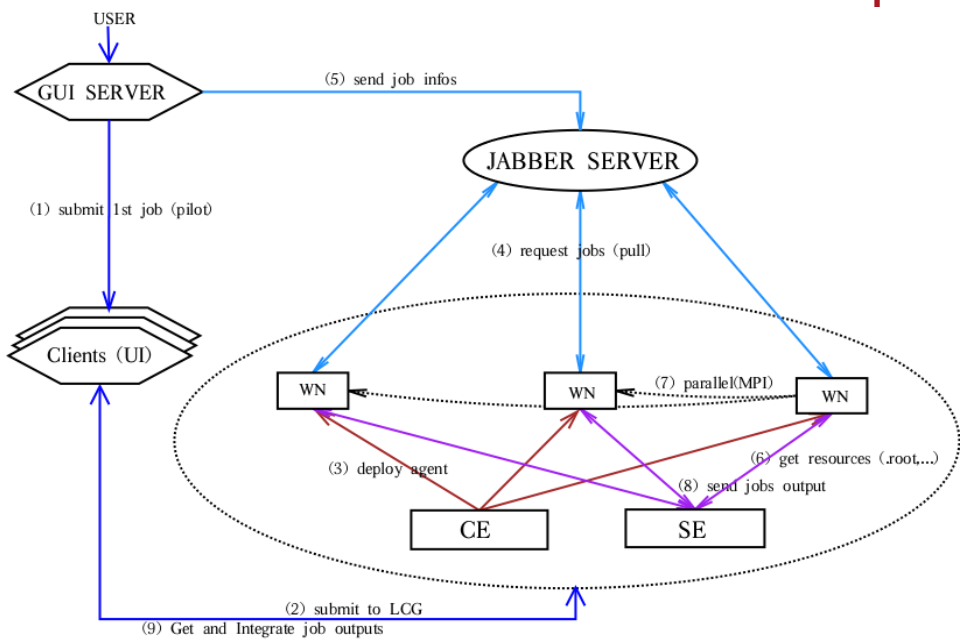
- The left histogram is for the 1st reconstruction:events: 536165 background: 537473,difference:1309±733(stat.) ±?(sys.), expected deficit number :3168(**~ *N*bg ×π (Moon Radius)²/ (6 ×6)**
- The right histogram is for the 2nd reconstruction:event:: 539039,background: 540060,difference:1021±734(stat.) ±?(sys), expected deficit number :3178(**~ *N*bg × π (Moon Radius)²/ (6 ×6)**

Next developments

- API for the data transfer procedure and more automatization of the whole procedure
- Use of the ARGO GRID infrastructure in Italy and China

New Job submitting and monitoring

- **GUI for job submitting in batch mode**
- **Dataset Selection**
- **….**



Thank you!

For more information of or joining to EUChinaGrid Project:

Contact Gang.Chen@ihep.ac.cn